
Status & Remarks

The application presently contains the following claims:

| <i>Independent Claim #</i> | <i>Dependent Claim #s</i> |
|----------------------------|---------------------------|
| 1 | 2-7, 28-30 |
| 8 | 9-17, 31-33 |
| 18 | 19-27, 34-36 |

The applicant's attorney kindly thanks the examiner for acknowledging the request for continued examination, removing the finality of the previous Office Action, and considering the applicant's submission filed on February 26, 2007.

Claims 1, 8 and 18 are amended in this response.

Support for the amendments to the claims may be found with reference to originally submitted paragraph [0007] in which it is stated that:

"[0007] Briefly, the invention provides a process which uses an air jet containing non-abrasive particulate media at a low pressure which selectively removes thermal barrier coatings from components without damaging the metallic substrate. This process selectively removes thermal barrier coatings from the cooling holes of components."

As well as taken in conjunction with originally submitted paragraphs [0009] through [0011]. The claims were amended so as to enlarge the scope of the claims and accommodate the incorporation of a bond coat interfaced between the substrate and the thermal barrier coating as mentioned in originally submitted paragraph [0003].

Claims 28-36 are newly added. Support for the newly added claims may be found with reference to originally submitted paragraph [0003], last sentence in which it is stated that "Typical bond coats include, but are not limited to, MCrAlY, wherein M is Ni, Co, Fe or mixtures thereof, or a diffusion aluminide or platinum aluminide coating."

35 U.S.C. §102

The examiner has rejected Claims 1-7 as being anticipated by *Sangeeta et al.*'s US Patent No. 5,976,265 ("*Sangeeta*"). The examiner represents that *Sangeeta* discloses a process for removing a thermal barrier coating from a metallic substrate surface by directing an air jet at the thermal barrier coating on the substrate surface of the component, the jet comprising non-abrasive particulate media such as glass beads, the average particle size being less than 500 microns and the air jet being directed at the thermal barrier coating at a pressure less than 40 psi sufficient to remove the thermal barrier coating but insufficient to damage the substrate surface.

Applicant respectfully points out that *Sangeeta* teaches of a method for removing an aluminide-containing material from a metal substrate – not for removing a thermal barrier coating. As is described in the Background section of *Sangeeta*, aluminide-containing materials are used for many purposes, including serving as a bonding layer for a thermal barrier coating. Even the applicant acknowledges the same in originally submitted paragraph [0003] of the application wherein it states that "Typical bond coats include, but are not limited to, MCrAlY, wherein M is Ni, Co, Fe or mixtures thereof, or a diffusion aluminide or platinum aluminide coating." However, it is well known in the art that aluminide coatings (diffused or not) are oxidation and/or corrosion aluminum based barrier coatings and are not considered as thermal barrier ceramic coatings. In fact, it is well known that aluminum and aluminides are, in fact, heat conductive materials.

The process taught by *Sangeeta* is not the process claimed in claim 1, as amended, and the dependant claims thereto. *Sangeeta* teaches of a process which requires chemical and or stripping solutions (including but not limited to hydrochloric acid, ethanol & sulfuric acid) in order to "degrade" the aluminide coating for removal. *Sangeeta* further states that "the degraded coating is then removed without damaging the substrate" (column 5 line 5 - 67). *Sangeeta* states (column 5) "in contrast to prior art processes, the present invention includes a gentle **abrasion** step which minimizes damage to the substrate" (emphasis added). *Sangeeta* further states (column 5) that " Various **abrasive** particles may be used for the grit-blasting" (emphasis added).

The process as currently claimed, in contrast, teaches of a **non-abrasive** method of removing thermal barrier coatings from a metal substrate. *Sangeeta* does not teach a method as claimed in amended claim #1.

35 U.S.C. §103

The examiner has rejected Claims 8-27 under 35 U.S.C. §103(a) as being unpatentable over Applicant's Admitted Prior Art ("AAPA") in view of *Sangeeta*. The examiner asserts that the AAPA teaches of known methods of removing thermal barrier coatings from turbine blades as well as from laser drilled cooling holes in turbine hot section components. Known methods include waterjet blasting to remove barrier coating from components during manufacturing and repair, including air-cooled components, which creates wear and erosion of the underlying substrate. The examiner submits that the AAPA does not disclose directing an air jet at the thermal barrier coating on the substrate coating, the jet containing non-abrasive particulate media and being emitted from a nozzle at a low pressure insufficient to damage the substrate surface. The examiner asserts, however, that *Sangeeta* teaches such thermal barrier removing process, making it obvious to one of ordinary skill in the art at the time the invention was made, to have removed the thermal barrier coating from the cooling holes of a metallic turbine engine by directing an air jet at the thermal barrier coating, the jet containing non-abrasive particulate media and being emitted from a nozzle at a low pressure, in light of the teachings of *Sangeeta* in order to remove the thermal barrier coating without damaging the underlying metallic surface of the substrate. Applicant again respectfully points out that *Sangeeta* does not teach of a process to remove a thermal barrier coating, but instead teaches of a process for removing an aluminide-containing bond coat material from a metal substrate.

The applicant's attorney would respectfully request that the Examiner revisit the rejections in view of the following arguments as associated with the amended pending claims. *Sangeeta* teaches of a process that requires a substrate with a coating to be contacted by a stripping composition prior to the blasting of any non-abrasive particulate. *Sangeeta* requires the use of a stripping composition and in some cases additional treatment steps such as rinsing steps to loosen the thermal barrier coating, compromising the coating and allowing the coating to be removed by a blasting of particulate. *Sangeeta* provides no teaching of any process by which a thermal barrier coating can be removed solely by the blasting of non-abrasive particles, as is taught by the present application.

It is well settled that the omission of an element and its function within an already known invention is only an obvious expedient if the remaining elements perform the same function as before. See *Application of Karlson*, 311 F.2d 581 (CCPA 1963). In the present matter, the present invention eliminates the necessary *Sangeeta* element of requiring the use of a chemical stripping composition to loosen the coating. The present invention not only eliminates that element and function of *Sangeeta*, but also changes the function of the invention, in order to achieve the same purpose. The improved function of the present invention, that was not foreseen by the *Sangeeta* reference, allows the removal of the coating from the metal substrate without degrading the coating with a chemical stripping agent. The elimination of

Sangeeta's necessary element and function of the element, while performing a different function shows the present invention in the application at hand is not an obvious variation of the *Sangeeta* reference.

The present invention allows for the removal of the thermal barrier coating without the use of a chemical stripping agent. This is not so with the *Sangeeta* reference. This elimination of elements and different outcome to serve the same purpose is illustrated in the chart shown below:

| <i>Sangeeta Reference</i> | <i>Present invention</i> |
|--|--|
| Substrate with coating is contacted by stripping composition. | ELIMINATED |
| Coating is degraded for ease of removal. | ELIMINATED |
| The degraded coating is then removed by use of various abrasive particles. | The intact thermal barrier coating is removed by use of an air-blasted non-abrasive particles. |

Furthermore, even with the additional steps of contacting the coating on the substrate with a stripping composition, the *Sangeeta* process would not produce the same results as the process of the present invention as claimed in the current claim 8 and 18, and the related dependant claims thereto. *Sangeeta* provides no method for removing a thermal barrier coating solely from a hole or other portion of a substrate without affecting the coating on the remainder of the substrate. When using the stripping composition required by the teachings of *Sangeeta*, the coating over the entire substrate, including the coating in the holes as well as the coating over other portions of the substrate, is loosened and compromised. This makes it impossible to use the teachings of *Sangeeta* in the removal of a thermal barrier coating solely from a hole of the substrate.

Notwithstanding the foregoing, independent claims 1, 8 and 18 have been amended to clarify the foregoing and Applicant's attorney believes the amended claims clearly define over the prior art and that all claims are in position for allowance.

Request for Reconsideration

Applicant believes that all independent claims clearly define over the prior art and that the distinctions between the present invention and the prior art would not have been obvious to one of ordinary skill in the art. Additionally, the remaining dependent claims, by the limitations contained in the base independent claims, are felt to be patentable over the prior art by virtue of their dependency from

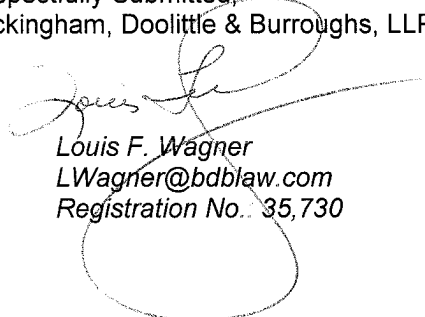
independent claims which distinguish over the prior art of record. All pending claims are thought to be allowable and reconsideration by the Examiner is respectfully requested.

It is respectfully submitted that no new additional searching will be required by the examiner. A fee determination sheet is attached for this amendment response. The Commissioner is hereby authorized to charge any additional fee required to effect the filing of this document to Account No. 50-0983.

It is respectfully submitted that all references identified by the examiner have been distinguished in a non-obvious way. If the examiner believes that a telephonic conversation would facilitate a resolution of any and/or all of the outstanding issues pending in this application, then such a call is cordially invited at the convenience of the examiner.

*Buckingham, Doolittle & Burroughs, LLP
3800 Embassy Parkway
Suite 300
Akron, Ohio 44333
(330) 258-6453 (telephone)
(330) 252-5452 (fax)
Attorney Docket #: CGT-120 (58467.0028)*

Respectfully Submitted,
Buckingham, Doolittle & Burroughs, LLP



*Louis F. Wagner
LWagner@bdblaw.com
Registration No. 35,730*